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EXAMINER

LEE, RIP A

ART UNIT

PAPER NUMBER

1713

DATE MAILED: 08/21/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/009,094

Applicant(s)

SOGA ET AL.

Examiner

Rip A. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2, 6, 8-11, 16 and 17 is/are allowed.
- 6) ☒ Claim(s) 1, 3-5, 7, 12-15 and 18-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This office action follows a response filed on June 20, 2002. Applicants have amended claims 1, 2, 5, 6, 9, and 11-22. Notably, claims 1, 2, 5, and 6 exclude use of borate complexes of general formula $B(Ph_4)X$. Claims 9 and 11-22 were amended to correct matters of form.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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4. Claims 1, 3-5, 7, 12-15, and 18-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. Patent No. 5,391,629 to Turner *et al.*

Turner *et al.* discloses a process for polymerization of olefins in the presence of a catalysts comprised of a cyclopentadienyl ligand group IVB metal component and a second component of a compatible non-coordinating anion to produce a first living polymer (claim 1). Monomers include ethylene, propylene, and 1-butene (claim 10). Since hafnium and zirconium are both group 4 metals, the claim encompasses use of cyclopentadienyl ligand group hafnium components and cyclopentadienyl ligand group zirconium components. According to claim 7, the activated catalyst complex product is represented by the formula $[A-CpMX_1(L')][B(C_6F_5)_3(X_3)]$ wherein X_3 is a hydride, halogen or hydrocarbyl radical. The skilled artisan immediately appreciates that such a formula would require use of $B(C_6F_5)_3$ as an activator. According to the inventors, polymerization may be carried out at any temperature within the range of -80 to 80 °C (col. 5, line 20). Thus, the catalyst components are taught in the prior art, as is the process of polymerization at low temperatures using these catalysts.

The reference is silent with respect to the molecular weight distribution of the first living polymer. However, there is sufficient reason to believe that use of these catalysts, described in Turner *et al.*, at a temperature of about -80 °C, as described, results in a living polymerization system. Rationale for this notion is derived from the fact that the prior art describes essentially the same process as that recited in the present claims. Further evidence comes from the fact that polymerization at 0 °C using $[Cp_2HfMe][B(pfp)_4]$ results in the formation of polymer with molecular weight distribution of 1.48 (Example 7). As indicated by the inventors, higher

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temperatures cause chain transfer to be more rapid relative to propagation (col. 3, lines 27-32). It follows that chain transfer is less rapid relative to propagation at lower temperatures. Hence, the molecular weight distribution is likely to approach unity at lower temperatures. Lastly, polymers prepared from the catalysts have a molecular weight distribution less than 3 (claim 1), implicating that M_w/M_n of the first living polymer is likely to lie within the range recited in the present claims. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02.

Allowable Subject Matter

5. Claims 2 and 6 are allowed since Turner *et al.* does not teach a process of polymerization of olefins in the presence of a catalyst which contains the third, organoaluminum component of general formula $AlR_{3-n}Y_n$. Claims 8 and 9 are allowed over Turner *et al.* because the reference does not teach a process of polymerization of olefins in the presence of a catalyst containing both zirconium and titanium complexes. Dependent claims 10, 11, 16, and 17, therefore, are allowed.

Response to Arguments

6. The Applicant's arguments with respect to claim rejections set forth in the previous office action have been considered, but they are moot in view of the new ground(s) of rejection. Nonetheless, relevant concerns will be addressed here.

Applicants submit that polymers described in the patent exhibit molecular weight distributions of 1.35 – 4.1, the values of which lie outside the range presently claimed. The examiner notes that examples in patents represent non-limiting illustrations of the invention. A disclosure in a reference is not limited to its specific illustrative examples, but must be considered as a whole to ascertain what would be realistically suggested thereby to one of ordinary skill in the art. *In re Uhlig*, 376 F.2d 320, 153 USPQ 460.

This point notwithstanding, the examples in Turner *et al.* have been reviewed thoroughly. The polydispersity indices reported therein reflect those of the overall polymer or those of polymers formed under disparate reaction conditions. The teachings of the patent allow for the embodiments currently recited in the instant claims (compounds of type [A-CpMX₁(L')][B(C₆F₅)₃(X₃)], polymerization at temperatures of about –80 °C). Sufficient reason has been established to believe that such an embodiment would result in formation of polymer whose molecular weight distribution lies within that presently claimed. Consequently, the Applicants must bear the burden of providing evidence to the contrary.

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Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (703)306-0094. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (703)308-2450. The fax phone number for the organization where this application or proceeding is assigned is (703)746-7064. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

ral

August 18, 2003



DAVID W. WU
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